CLAIMS

1/ A mold for hot-forming a thermoplastic lens, the mold comprising two dies mounted in a sheath to slide along the axis of the sheath, and each presenting a transverse forming face facing the other, wherein the two dies and the sheath are provided with intrinsic and both-way heat transfer means.

2/ A mold according to claim 1, in which each die comprises:

· a base containing at least a fraction of the heat transfer means of said die, and means for connecting them to a heat transfer source; and

· a removable insert fitted to the base and carrying the forming face.

3/ A mold according to claim 2, in which the base of each die receives all of the heat transfer means of said die, the insert having no such means, being temperature regulated solely by heat transfer with the base.

4/ A mold according to claim 1, in which the sheath possesses an annular recess open to the inside and communicating with the interstitial gap defined by the forming faces of the two dies.

5/ A mold according to claim 4, in which the interstitial gap defined by the forming faces of the two dies co-operates with the annular recess to form a sealed inside volume which is connected to the outside via at least one suction channel passing through the sheath.

6/ A mold according to claim 5, in which the suction channel opens out into the annular recess.

7/ A mold according to claim 4, including a trimming ring slidably mounted in the sheath.

8/ A mold according to claim 7, in which the trimming ring co-operates with a lip bordering the annular recess.

9/ A mold according to claim 4, in which the sheath has two portions mounted to slide relative to each other along the same sliding axis as the dies between firstly an open configuration giving direct access to the interstitial gap defined by the forming faces of the two dies and secondly a closed configuration in which the two portions are in contact via junction faces in a transverse join plane.

10/ A mold according to claim 9, in which the annular recess of the sheath is implemented in the form of a groove formed as a setback in the junction face of at least one of the two portions of the sheath.

11/ A mold according to claim 10, in which the groove possesses draft taper.

12/ A mold according to claim 1, in which the heat transfer means comprise an internal circuit for circulating a heat-conveying fluid.

13/ A method of hot-forming a thermoplastic lens, the method comprising the steps of:

. providing a mold comprising two dies mounted in a sheath to slide along the axis of the sheath, and each presenting a transverse forming face facing the other, the two dies and the sheath being provided with intrinsic and both-way heat transfer means ;

· placing a parison or preform of said thermoplastic material between the two dies and enclosing the assembly in the sheath;

· heating the dies and the sheath by their intrinsic heat transfer means up to a forming temperature;

· moving the dies towards each other to shape the material by plastic deformation until a predetermined relative position is reached corresponding to the thickness desired for the lens;

· cooling the dies and the sheath by their intrinsic heat transfer means down to an unmolding temperature; and

· extracting the finished lens from the mold.

14/ A forming method according to claim 13, in which the forming temperature is greater than or equal to the vitreous transition temperature of the thermoplastic material used.

15/ A forming method according to claim 14, in which the forming temperature exceeds the vitreous transition temperature of the thermoplastic material used by an amount lying in the range 30°F to 120°F.

16/ A forming method according to claim 15, in which the forming temperature exceeds the vitreous transition temperature of the thermoplastic material used by an amount of about 45° F.

17/ A forming method according to claim 13, in which the unmolding temperature is significantly below the vitreous transition temperature.

18/ A forming method according to claim 17, in which the unmolding temperature presents with respect to the vitreous transition temperature a difference lying in the range 20°F to 50°F.

19/A forming method according to claim 18, in which the unmolding temperature presents with respect to the vitreous transition temperature a difference of about 35° F.

20/ A forming method according to claim 13, using a mold in which the interstitial gap defined by the forming faces of the two dies co-operates with the annular recess to form a sealed inside volume which is connected to the outside via at least one suction channel passing through the sheath, including, before and/or simultaneously with the dies being moved towards each other in order to shape the material by plastic deformation, a step of establishing a relative vacuum in the sealed inside volume of the mold by means of the suction channel.

21/ A forming method according to claim 20, in which the relative vacuum is lower than 0.25 bar.

22/ A forming method according to claim 21, in which the relative vacuum lies in the range 0 to 0.1 bar.

23/ A forming method according to claim 13, and using a mold including a trimming ring slidably mounted in the sheath, including, after the material has been fully shaped by moving the dies towards each other, a step of actuating the trimming ring to cut off the peripheral flash formed by the surplus material projecting sideways from the dies.

24/ A forming method according to claim 13, including a step of pre-coating said parison or preform with any single or multi layer coating before being placed between the two dies.

25/ A forming method according to claim 13, including , before heating the dies and the sheath, a step of disposing a thermoplastic film between the parison or preform and at least one of the two dies, said thermoplastic film being applied and self-welded to the corresponding face of the lens during the shaping step.

26/ A forming method according to claim 25, including a step of coating the film with any single or multi layer coating.

27/ A forming method according to claim 25, including a step of providing a photochromic film .

28/ A forming method according to claim 25, including a step of providing a polarized film.

29/ A forming method according to claim 25, including a step of providing a tinted and/or colored film.

30/ A forming method according to claim 13, including a step of disposing a single or multi layer coating on at least one of the two dies before heating them, this coating being then hot-transferred on the corresponding face of the lens during the shaping step.